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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/027,823	12/21/2001	Joseph Louis Petrucci JR.	SC0268WD	2500

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EXAMINER
CHEN, KIN CHAN

ART UNIT	PAPER NUMBER
1765	

DATE MAILED: 08/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/027,823	PETRUCCI, JOSEPH LOUIS	
	Examiner	Art Unit	
	Kin-Chan Chen	1765	

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) 16-22 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-15 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claim1-15, drawn to a method, classified in class 438, subclass 706.

   II. Claim16-22, drawn to a system, classified in class 156, subclass 345.

2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus as claimed can be used to practice another and materially different process such as optical lens fabrication.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Ms. Kin-Marie Vu on May 27, 2003 a provisional election was made wihtout traverse to prosecute the invention of Group I, claims 1-15. Affirmation of this election must be made by applicant in replying to this Office action. Claims 16-22 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

3. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 12, "deciding whether the performance of the plasma etch equipment is acceptable" is vague and indefinite because it can be arbitrarily defined , hence, it is unclear in boundary and scope.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Coss, Jr.et al. (US 6,594,589).

Coss teaches that a semiconductor wafer may be etched using a etching equipment. Data that depend on the performance of etching equipment may be extracted. The extracted data may be compared with predetermined data. The performance of the etching equipment may be decided as to whether it is acceptable on

the basis of a result of the comparison (col. 1, lines 25-50; col. 2, lines 15-35; Figs 1 and 4).

Coss discloses that the system may be a variety of processing tools (system) for the semiconductor device fabrication including photolithography, etching, and deposition. Hence, it would have been obvious to one with ordinary skilled in the art to include plasma etching system because it is one of the most commonly used etching system in the semiconductor device fabrication.

6. Claims 2-15 rejected under 35 U.S.C. 103(a) as being unpatentable over Coss, Jr.et al. (US 6,594,589) in view of Kropp et al. (US 6,258,497) or Markle et al. (US 6,046,796).

Coss teaches that a semiconductor wafer may be etched using a etching equipment. Data that depend on the performance of etching equipment may be extracted. The extracted data may be compared with predetermined data. The performance of the etching equipment may be decided as to whether it is acceptable on the basis of a result of the comparison (col. 1, lines 25-50; col. 2, lines 15-35; Figs 1 and 4).

Coss discloses that the system may be a variety of processing tools for the semiconductor device fabrication including photolithography, etching, and deposition. Hence, it would have been obvious to one with ordinary skilled in the art to include plasma etching system because it is one of the most commonly used etching system in the semiconductor device fabrication.

Coss teaches generating data based on the comparison between the received tool parameter related to the processing of a wafer and the predetermined tool parameter (abstract). Coss is not particular about the parameter being used in the method. Hence, it would have been obvious to one with ordinary skilled in the art to used the signals generated by optical devices (such as optical emission spectroscopy) and calculate etch rate because it is a common practice during the plasma etching process monitoring in the art of semiconductor device fabrication. Kropp (Fig. 2; col. 4, lines 15-30) or Markle (abstract; Figures) is relied on to show the applications of using OES in the plasma etching process. Because it is a common practice in the art of semiconductor device fabrication and because it is disclosed by Kropp and Markle. Hence, it would have been obvious to one with ordinary skilled in the art to use the monitoring tool and method of Kropp or Markle in Coss. With thickness of film being etched and data generated from OES available, it would have been obvious to one with ordinary skilled in the art to perform the calculation and data manipulation for etch rate.

As to non-uniformity of an etched surface (instant claims 3, 11, and 12), Coss teaches that the tool health monitor including a library of tool health models (col. 3, lines 33-35) which may be developed empirically (so-called historical data in claim 9), the gap between the expected tool parameters and the actual tool parameters may be used to determine the tool health rating. If the tool health rating falls below a predetermined threshold, a maintenance may be performed (col. 2, lines 18-24). With the combination of OES data of plasma etching generated from Kropp or Markle, it would have been obvious to one with ordinary skilled in the art to calculate and compare the real trace

and ideal trace (referring to Fig. 4 of the applicant's specification) and determine the non-uniformity because Coss teaches comparing the expected tool parameters and the actual tool parameters, and because Kropp or Markle teaches that the tool parameters may be generated by OES for plasma etching. Therefore, the above-cited claims are rejected over the combined prior art for the same reasons, supra.

The above-cited claims differ from the combined prior art by specifying well-known features (such as calculating the etch rate using interferometric endpoint signals) to the art of semiconductor device fabrication. It is the examiner's position that a person having ordinary skill in the art at the time of the claimed invention would have found it obvious to modify the combined prior art by adding any of same well-known features (conventional materials and process) to same in order to provide their art recognized advantages and produce an expected result.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (703) 305-0222. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (703) 305-2667. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2934.

K. C. Chen
KIN-CHAN CHEN
Primary Examiner